GRUMMAN plane news

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Suggestion awards hit new highs; Pl. 56 claims 4 winners

September's 201 Project Sterling Suggestion Award winners included two stand-out winners among the many outstanding suggesters. For the first time in the seven-year history of the program, one suggester, Dan McKeown of Plant 7, won both first and second prizes in the same month for a grand total of $4000 (face value) in U.S. Savings Bonds.

A jackpot of a different sort was hit by the second big winner, Plant 56 in Glen Arm, Md. That facility won big in September, claiming four winners out of the 17 Grummanites who earned at least $600 in bonds, including two who placed third and fourth.

What's remarkable about a single plant having four top winners in a month? In Plant 56's case it's that the entire work force totals 145 persons, giving Glen Arm a very big leg up in percentage participation for the $600-and-over group.

For the two biggest winners from Glen Arm the Suggestion Awards were gratifying for a number of reasons. "Beautiful," said Leadman Bob Cutlip when he learned that he had won savings bonds with a total face value of $1200, the third highest award for the month. "It makes you feel good that you can do stuff like this," said Cutlip about his award-winning idea for changing the diameter and placement of coolant lines for numerical-controlled hydrotel milling machines. The resulting improvement in the efficiency of the milling process saved about an hour per day on each of six like machines in the plant.

A coworker, Leadman Glen Riley, Jr., has made a habit of winning Suggestion Awards, but his latest award for $1,075 is his largest, putting him in a tie for fourth. Riley proposed that one of Plant 56's tape-run automatic milling machines be reprogrammed which resulted in savings estimated at $10,000 for the first year.

"I don't have any plans," said asembly-riveter Harold Fowler of Plant 1 in answer to how his $1075 in bonds would be used. "I didn't plan on getting that much money," he explained, "but I'll probably hold on to it until I need it." Fowler was able to cut an estimated 18 hours off the assembly time for each F-14 by discovering a way of assembling part of the mounting for the Tomcat's machine gun outside the aircraft—a much less difficult and time-consuming task.

Like many other winning ideas, Fowler's was the result of his seeing a problem—in his case, an awkward inside assembly—and then exploring different ways to solve it. With the F-14 gun mount, it involved changing the placing of some rivets as well as the ingenuity involved in perfecting a better assembly method. Fowler's idea made him the fourth highest winner (in a tie for September with Glen Riley).

Two other outstanding innovators from Glen Arm are electronic technicians Ed Redel and Bill Meininger who shared $600 in bonds. Redel and Meininger jointly originated an idea for a new parity circuit for the punched

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Savannah move outlined by Grumman American

Grumman American Aviation Corporation recently amplified its plans for a major expansion of its Travis Field facilities at Savannah when Corwin H. (Corky) Meyer, President of Grumman American, outlined the move of Corporate Headquarters and the company's light aircraft manufacturing operations from their present location in Cleveland, Ohio, to the Georgia plant over a two-year period.

According to Meyer, elements of the corporate staff and an engineering group will move to Savannah starting the first half of 1975. "The Savannah facility has already commenced limited production of parts used in the Cleveland assembly line," he said, "and the production process will gradually be increased as new facilities and equipment become available."

The Savannah plant was completed in 1967 at a cost of $7,500,000; Grumman added a $1,000,000 expansion in 1970. "The effect of this latest expansion," Meyer said, "will be felt almost immediately. During the next several weeks, we will commence work on the remodeling and rearranging of the existing building and equipment to accommodate advance elements of the Cleveland group. Construction of a 38,000-square-foot warehouse will be started almost as quickly. The remaining plant expansion will start in about six months."

According to Al Lemlein, Executive Vice President of Grumman American, when the transfer of Cleveland operations is completed, employment at the Savannah facility will exceed 1,000 people.

Meyer stated that "We're enthusiastic about the consolidation of our operations in a single location. The economies we achieve through consolidation will permit the investments necessary to expand our line of aircraft. We intend to become a major force in general aviation in this decade."

Grumman American's Cleveland Division entered the general aviation

(Continued on page 3)

McKeown is top winner

"You can't possibly do that," was what several of his coworkers told VAST Technician Dan McKeown, when he decided to look for a quicker and better way of weeding out program errors in computer test tapes. But McKeown could indeed do it, and he not only saved himself and coworkers a load of time-consuming and repetitious correction work but he also received savings bonds worth $2600 face value for his efforts. It was the highest award for September.

And being first wasn't enough, either. The second place winner, receiving $1,400 in face value of savings bonds, was none other than Dan McKeown.

For McKeown had had another idea—a way of automatically verifying the final VAST tapes, that did away with about two days of labor usually required for verification of many of the tapes. The Suggestion Award for that idea makes McKeown the first person to win both first and second place in one month, netting the two-time winner $4,000 in all. The two awards also marked the first time McKeown has won in the Suggestion Award program.

McKeown says he's always been interested in finding "any way to make my job easier." He would spend his lunchtimes and coffee breaks and any other time when the huge VAST computer was not in use, to find out more about the multi-million dollar machine and how he could use its complex electronic gadgetry better. The VAST system (short for Versatile Avionic Shop Test) is designed to isolate failed avionics components; McKeown's job involves verifying, that is, checking out, the magnetic tapes that run the computer.

As McKeown expanded his knowledge of VAST's capabilities, he learned how to program the computer to play Tic Tac Toe—his after-hours amusement was the center of attention at a subsequent open house—and more importantly how to automate the corrections and verification processes, which netted McKeown his $4,000.

When asked what he was going to do with the money he won, McKeown replied, half-humorously, "I'm going to pay my gas and oil bills." And if McKeown doesn't have a solution for that problem it isn't from lack of trying. "I've worked on trying to get more miles to the gallon out of an automobile using every device on the market—so far without much success," he says.

"But," he says, "I'm still working on it."

Innovative ways with plastic bring big savings

Innovation has been a hallmark at Grumman since its founding in a small garage in Baldwin, Long Island. Since then, improvements in manufacturing methods and processes have continued to contribute to decreasing the costs of products . . . and the continuance of this effort has never been more critical than today because of rising material costs and inflationary trends.

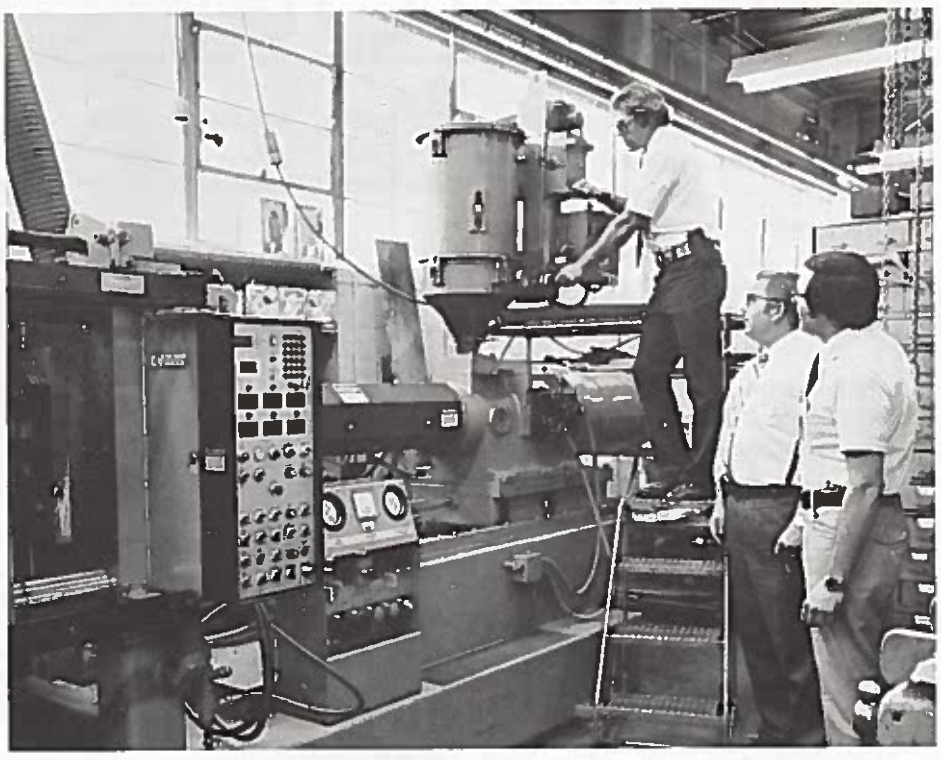
The people at Plant 27 are contributing their share to cost reduction in the plastics field, among others. General Manager Ed Warenik and an innovative team of Engineering and Manufacturing personnel are planning to convert to plastic as many nonstructural aircraft components as possible at a considerable dollar cost saving. This program was initiated by Bob Hieter, former general manager of Plant 27 and now general manager of Detail Parts Operating Unit.

The new push toward plastics by Warenik's group is made possible by two important innovations:

• A new injection mold die system —christened the "Universal Die Base" —which greatly increases injection mold flexibility and drastically reduces the cost of tooling required for the manufacture of plastic parts; and

• The acquisition of a new injection molding machine which increases both capability and speed.

A new way. Tool Shop Keyman Al Helrigel (L) originator of the Universal Die Base and Tony Mascolo try out one of the die base's interchangeable inserts.



Plastics giant. The Cincinnati Injection Molding Machine will greatly increase Plant 27's plastics capability. Engineer Vic Rumore (L) adjusts a valve while Bob Heiter (C) and Engineer Tony Mascolo look on.

The injection molding machine was acquired largely through the efforts of industrial engineer Vic Rumore, said Hieter.

The metal die and the injection mold machine are the two essential elements of the molding process — the injection of hot plastic under high pressure into the metal die or mold, where it is cooled, removed and then readied for the final stages of the manufacturing cycle, inspection, packaging and shipping.

The Universal Die Base is a massive base which eliminates the need for individual die bases usually required in the manufacture of plastic parts. This enables rapid insertion of mold inserts without the usual long setup time, which results in sizable cost reductions. The new die base is the brainchild of Tool Shop keyman Al Helrigel who invented and developed the new concept with the technical assistance of Tony Mascolo of Plant 27 Engineering.

In concert with the new Cincinnati Injection Molding Machine, the Universal Die Base will greatly expand the capacity as well as the flexibility of the plant's plastics manufacturing operations.

As a result of these two big improvements, Ed Warenick is looking for a lot more business and already has plans to produce some 100 aircraft parts in plastic that have been manufactured from fiberglass, phenolic, or metal. For example, one component was estimated to cost $130 per unit when produced in metal. When transformed to plastic, the same component cost a mere 90 cents per unit—a decrease of over 99 percent.

Savings result not only from the lesser cost of plastic over most other materials but from elemination of all the stamping, welding, anodizing and painting required to produce most metal components.

But the greatest savings come when the component is designed in plastic from the beginning. "We're looking for close management-engineering-production cooperation to take advantage of the cost savings, and the improved performance, available through plastic components," Mascolo points out.

Cost consciousness doesn't end with producing aircraft or ground support components. A new "Hot Sprue" injection nozzle will eliminate a significant amount of waste material—and whatever waste plastic remains will be sold as scrap to a nearby commercial manufacturer.

Though plastics may be cheap, both Hieter and Warenik make clear that the results are anything but. "When we convert a component to plastic we not only save money but frequently improve the part's performance. Plastics produced at Plant 27 can achieve the high tolerances and the high standards of strength and durability — equaling or exceeding the materials they are repjlacing," Hieter stated recently. Adds Mascolo, "With the range of plastic materials we have available at Plant 27, we can meet varying requirements for durability, slipperiness, light conduction and, of course, plastic's unique resistance to corrosion, thereby eliminating the need to finish parts by anodizing, priming and painting."

For example, one type of plastic called "Nylafil," a 40 percent fiberglass reinforced nylon, is unusually tough and durable and is used for a wide range of components, such as the diffuser assembly.

With the natural advantages of plastic added to the plant's increased production capacity and capability, Warenik is hoping that Grumman will find more opportunity to utilize the design advantages this new potential presents.

"We'll do everything we can here to smooth the way for the engineer who may be thinking in terms of plastic," says Mascolo.

If you think what you are working on might be done better in plastic, contact Tony Mascolo in Plant 27, Ext. 1905 or 84668.

Picnic salute

A crowd of over 400 people enjoyed the singing, dancing, pantomine and sky diving that made up the varied program at the second annual Richie Cope, Have-a-Heart Picnic, held October 11 at the Calverton picnic grounds.

Toward the end of the event GAC President George Skurla presented Grummanite Richie Cope with a $2,335 check, representing the picnic's proceeds. The money will be used by HEART, an organization started by Cope to aid persons who like himself have undergone heart transplant surgery.

OBITUARIES

GASPARE J. DIMINO of Structures, Plant 6, died October 1 8at the age of 50. He had been with Grumman since 1965 and lived at 2404 Waverly Avenue, Medford.

OSCAR H. KRITSBERG of Details and Subs. - Management, Plant 3, died October 20 at the age of 61. He had been with Grumman since 1952 and lived at 5009 Creek Bend Drive, Austin, Texas.

plane GRUMMAN news

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Suggesters earn $38,000

Pl. 56 winners. **Leadman Bob Cutlip (above) won $1200 to place third. Co-worker Glen Riley (left) tied for fourth with $1075.**

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tape hole tolerance rig to provide additional capability for recognizing faulty tape-punching. The joint award put Meininger and Redel 13th among the stand-out winners.

September award winners as a group achieved another record—the highest dollar amount of U.S. Savings Bonds for any one month, $38,000, or $4,000 more than the previous record set the month before.

Other award winners for September are:

$1,000 - Joseph Cavola, Advanced Composites, Pl. 3.

$875 - John Impagliazzo, F-14, Flt. Prod., Pl. 7.

$750 - Kenneth Rafuse, Avionics, Pl. 7.

$750 - Kathleen McGuire, Alodine, and John Burkhardt, Parts Paint, Pl. 3; Salvatore Ciancimino, Final Install., and Joseph Chernes, Final Install., Pl. 43.

$675 - John Transue, Ordnance, Pl. 6.

$625 - John Hooper, Engraving, Pl. 3.

$600 - J. Edward Redel, Mach. Shop, and William Meininger, Mach. Shop, Pl. 56; Thea Bunns, Final Assem., Pl. 6.

$550 - Edwin Cooley, Sub. Assembly, Pl. 1; Salvatore Buonicontro, Final Assembly, and Robert Cruz, Manufacturing Inspection, Pl. 1.

$500 - William De Longis, Mach. Parts/Mat. Purchase, Pl. 30; Stephen Congro, Final Assembly, Pl. 6; Michael Ryan, Jr., Wing Final Assembly, Pl. 3; Ronald Ibanez, Small Parts Fab., Pl. 3.

$450 - Salvatore Buonincontro and Robert McCullough, Final Assembly, Pl. 1.

$425 - Martin Foster, Manufacturing Inspection, Pl. 6; Franklyn Rufe, Sub. Assembly Major, Pl. 1.

$400 - Harry J. Huttenlocher, Nav. & Controls, Pl. 1, James Dante, Comp. Equip. Des., Pl. 1, Louis Della Salle, Comp. Equip/ Des., Pl. 35, and Wilbert Muller, Nav. & Controls, Pl. 1. Lawrence Ray, Wire Prep. Pl. 44, and William Ziegler, Maintenance, Pl. 5.

$375 - Peter Guido, Avionics, Pl. 7.

$350 - Bernard Barrett, Advanced Composites, Pl. 3; Willie Bishop, Advanced Composites, Pl. 3; Henry Vomittag, Parts Paint, Pl. 3.

325 - Gerard Brinker, Sub. Assembly, Pl. 1; Felix Alfano, Sub. Assembly, Pl. 1; Glen Riley, Jr., Machine Shop, Pl. 56.

$300 - Frank Prokop, Excel., Pl. 2; George Rath, Methods Engineer, Pl. 1, and Harold Dittmeier, Methods Engineer, Pl. 2; Stanley G. Jastemski, Transp. - Ops., Pl. 2; Roberta Cade, Materials Accounting, Pl. 30; Joseph Beine and Robert Albertson, Harold Osswa'd, Frank Abbondondolo and Robert Lentino: all of Sub. Assy., Pl. 1; William Rooney, Hydraulics, Joining Pl. 1.

$275 - Wayne Dillworth, Parts Prod. Control, Pl. 1; Rosario Strazzeri, Sub. Assy., Pl. 1; Glen Riley, Jr., Machine Shop. of Pl. 56.

$250 - Charles Randazzo, Fuse Sub. Assy., Pl. 1; John Peterson, Fluids, Pl. 6; Richard Wasenius, Final Assy., Pl. 6; Elliot Goldenberg, Production Eng., Pl. 7.

$225 - Edwin Cooley, Sub. Assy., Pl. 1; Joseph Corallo, Methods Eng., Pl. 4; John Adrion, Final Assy., of Pl. 6.

$200 - John Crawford, Steve Kish and Edward Smyth, all of Sub. Assy., Pl. 1; Charles Randazzo, William Harwood and Frank DiRocco, all of Fuse Sub. Assy., Pl. 1; Lou Baldassin, Equip. Lines, Pl. 1; William Santiago-Calo and Douglas McDonough, of Propulsion, Pl. 2; Ralph DeSiena and Wernar Lederman, E.B. Weld-Final Assy., Pl. 2; Alexander DeLorenzo and Roy Stephenson, Trans. Ops., Pl. 3; Albert Behpnick, Parts Paint, Joining, Pl. 3; Daniel Goldberg, Fluids, Pl. 6; William Staples, Support Eng., Joining Pl. 6; William Irish, Vast, Pl. 7; James Wetbb, Jr., Structures, Joining Pl. 7; Jerry Marenga, Elect. Eng., Pl. 15; Edward Nichols, Quality Control of Pl. 77.

$175 - Frank Bartlett, Mach. Eng., Pl. 1; Jack Thornton, Final Assy., Joining Pl. 1; Christopher Rizzuto, Conv. Machines, Pl. 3; William Rutherford, Machine Shop, Pl. 56.

$150 - Reginald Metcalf, Jr.; Kathleen Manikas and Hilda Bernardo, all of Config./Data Mgmt., Pl. 1; Isidore Scheinberg and Henry Windorst and Salvatore Tranchina; Edward Smyth, all of Sub. Assy., Pl. 1; Francis Loiacono and Henry Karr, Fuse Sub. Assy., Joining Pl. 1; Leonard Kalugin and Paul Havekotte, P/S Elec. Eng., Pl. 15; Albert Victorino, Rec. & Whsing, Pl. 17; Cary Harless, Final Assy., Pl. 77; Henry Gage, Methods Eng., Pl. 3, Michael Kornely Producibility, Pl. 2, Harold Sanders, Mat. & Proc. Eng., Pl. 12; Frank Mezzacapo, Ted Johnson of Reqm'ts. Planning, Pl. 30, and Jack Arnold, Mat. Control, Pl. 77, John Marks, Supply Data, Pl. 15, and Joseph Parisi, P/S Comp. Systems, Pl. 35; Lawrence Wicklund, P/S Elec. Eng., Pl. 4, and Albert Bauer, P/S Servo/Trng Dev. Eng., Pl. 35.

$125 - James Villani, Fuse Sub. Assy., Pl. 1: Clement Joie, Sr., Sub. Assy., Pl. 1; Bertram Rieger, Final Assy., Pl. 1; Manuel Encizo, Fuse Joining, Pl. 1; Leslie Elliot, Fuse Major Assy., Pl. 1; Richard Fossing, Methods Eng., Pl. 2; Robert DeSolms, Meas. Stds., Pl. 6; Joseph Kost, Mech. Eng. Design, Pl. 34; Al Handel, Router & Shear, Pl. 37; Royce Bates, Production, Pl. 88.

$100 - Robert Emmerich, Structural Design, Pl. 1; Charles Beck, Final Assy., Pl. 1; James Villani, Fuse Sub. Assy., Pl. 1; Alvin Beyerlein and Kenneth Korsberg - two-time winners of $100 bond, Frank Brown, Robert Groeber - a two-time winner of of $100 bond, and Sal Costello and Leonard Bonadonna, all of Sub. Assy., Pl. 1; Bruce Bender, Hydraulics, Pl. 2; Donald Mazur, Prod. Rel. & Analy., Pl. 2; Henry Ahlers - a two-time winner of $100 bond, Major Assy., Pl. 3; Alexander DeLorenzo and Roy Stephenson, Trans.-Opers., Pl. 3; Richard Seleska, Honeycomb Prep., Pl. 3; Raymond Muller, Insp-Mech., Pl. 4; Wallace Kondratowicz and George Wachsmuth, Robert DeSolms, all of Meas. Stds., Pl. 6; John Peterson - a two-time winner of $100 bond, Fluids, Pl. 6; Robert Wallace, Elec. Rep., Pl. 6; Oscar Perreault, Final Assy., Pl. 6; Thomas DiNicola, Mech. Insp., Pl. 7; Frank Hurley and James Pope, Q.C. Lab., Pl. 10; Paul Shaw, Metal & Weld Eng., Pl. 12; Al Allgeier and Joseph Nardi, Templates, Pl. 16; Henry Lobato and George Slavik, Config/Data Mgmt., Pl. 25; Thomas Jarvis and Thomas Kondos, Fiberglass, Pl. 27; Matteo Gaudioso, Proc. Serv., Pl. 30; Carol Goodwin, Budgets & Controls, Plt. 35.

$75 - Clement Joie, Sr., Robert Groeber, Frank Brown - a three-time winner of $75 bond, all of Sub. Assy., Pl. 1; Luca Tribuzio, Center Sect. Final, Pl. 3; Russell Ewers, Jr., Honeycomb Detail, Pl. 3; Julio Cardona, Final Assy., Plt. 6; Frank Cappiello, Meas. Std. Lab., Pl. 12; Daniel Schirmer, Sub Assy., Pl. 27.

$50 - Clifford Wulff, Records & Rel., Pl. 1; William Rooney - a three-time winner of $50 bond, Pl. 1; Edward Lombardi, Hydraulics, Pl. 1; Joseph Vioux, Felix Alfano, Robert Lentino, Charles Suntzenich, Jr., Ronald Evans, Louis Trapani, all of Sub. Assy., Pl. 1; Michael Grobeck - a two-time winner of $50 bond, James Villani, Rudolph Picone, all of Fuse Sub. Assy., Pl. 1; William Weremeichik - a three-time winner of $50 bond, James Szegfu, Charles Beck, all of Final Assy., Pl. 1; Ernest Kiesling - a three-time winner of $50 bond, of Major Subs., Pl. 1; Vincent Saputo, Sr., GSE-Mechanic, Pl. 2; Michael D'Ambrosio and Norman Jockel, of Tool Control, Pl. 2; Robert Andrews, Advance Composites, Pl. 3; Martin Foster, Mfg. Insp., Pl. 6; Clark Duncan and Edgar Phillips, Final Assy., Pl. 6; Peter Kraus, Q.C. Lab. Pl. 10; Kenneth White, Inventory Control, Pl. 30; Dorothy Grimes, Supply Ops., Pl. 30; Jerald Ernst, Elect. Drawer Fab., Pl. 43.

F-14 assist. **Tied for fourth, Harold Fowler cut man-hours off Tomcat assembly time.**

Savannah move outlined

(Continued from page 1)

markets in 1968 as the American Aviation Corporation. It produced a two-place single engine aircraft, utilizing metal bonding techniques only now being adopted by other major manufacturers. In January 1973, when American Aviation merged with Grumman's Savannah operations, American was producing small aircraft at the rate of 450 per year.

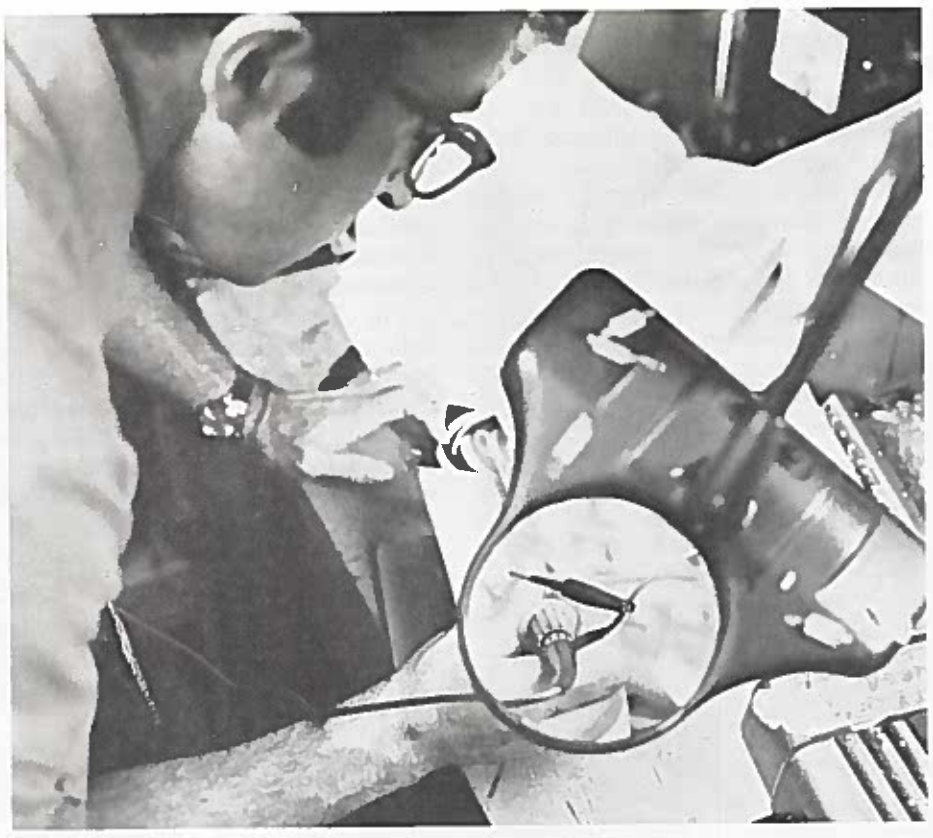
In addition to its current two-place Trainer, two-place sport and utility aircraft the TR-2, and four-place Traveler models, Grumman American's Cleveland Division recently introduced a higher powered single-engine model, the "Tiger." This new model will be included in its 1975 product line. Production of these aircraft will be transferred to the Travis Field facility during 1975 and early 1976. Thanks to recent changes, Meyer pointed out, the Traveler and the Tiger are the highest performance aircraft in their class produced today. The Grumman American Ag-Cat, an agricultural aircraft manufactured in Elmira, New York, will be administered from Savannah.

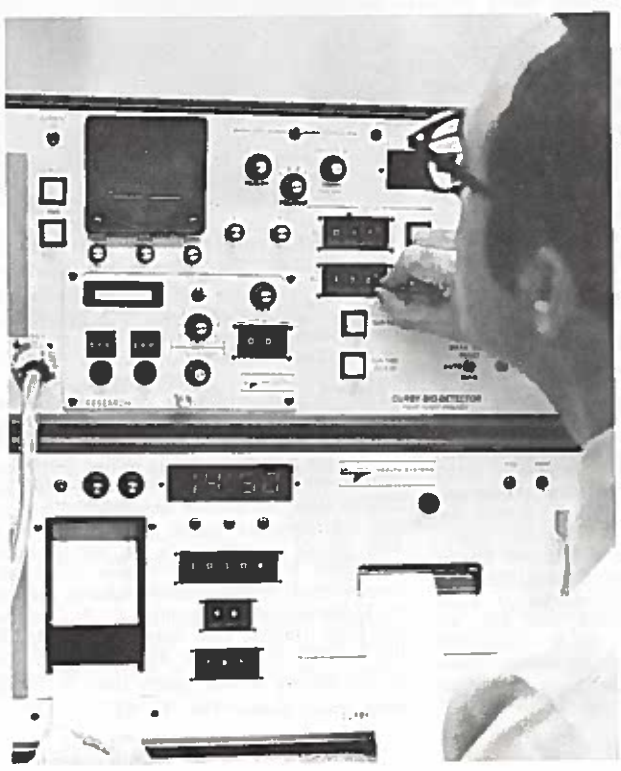
The design effort of the GA-7, a light twin-engine airplane currently under development, will be among the first elements to come to Savannah, according to Lemlein. Scheduled for introduction to the commercial market in 1977, the GA-7 will be designed, tested and built in Savannah.

At Savanah, the Gulfstream II corporate jet aircraft is being constructed, and, in addition, Grumman personnel there provide maintenance facilities and services for both the Gulfstream I and II.

Briefing Navy chief. **During Vice Adm. William Houser's visit to Bethpage October 17, the Deputy Chief of Naval Operations-Air Warfare got the chance to view some of Grumman's most recent endeavors, including a demonstration at the Tactical Flag Command Center Simulator at Plant 14. In this photo, Admiral Houser (2nd R), Vice President Butch Satterfield, and Rear Adm. Fred Koch, Director, Air Warfare Division, listen as E-2C Director Tom Guarino briefs Navy visitors on Hawkeye program.**

'TIGERWORKS': Their todays he





Since World War II Grumman aircraft have worn the tag: "Grumman Ironworks." But over the years, it has been the rugged, sturdy airframe engine combination *and* the effective integration of sophisticated avionic systems that have made Grumman aircraft number one in their field.

In order to insure that Grumman keeps that competitive — winning — edge, it is essential that the company keeps advancing in the electronics field. And that's just the task that the men and women are undertaking in Plant 14: the Advanced Electronic Systems Center.

This 100,000 square foot facility houses many of the advanced development and research programs for Grumman Aerospace. Although the work covers a broad spectrum in electronics, ranging from laser to micro-circuits to multiplex systems, all the programs undergoing study in Plant 14 have one ultimate goal: to provide a strong base on which to build Grumman's future.

Because today's aircraft are more electronically sophisticated, however, miles and miles of wires, cables, and harnesses are being used on the A-6 Intruder, E-2C Hawkeye, EA-6B Prowler, and F-14 Tomcat. George Cotter and his group in the Plant 14 multiplex systems lab are working on a solution to help curb the wire mileage in tomorrow's planes.

"The concept of multiplex systems has been around for many years," says Cotter, head of the multiplex lab, "but it has taken a while for the electronics end to develop so that it would be efficient, and economical . . . and a reasonable size."

For instance, in today's aircraft, there are many control switches in the cockpit that are turned on before the flight and turned off after the flight. Each control has its own pair of wires. But with the multiplex system, these infrequently used wires can all be "joined together" through a central control box in the cockpit and with the utilization of one double wire. Operating the control box, the pilot can program which circuit he wishes to activate. The message is transmitted over the wire. If he wishes to activate another control, he designates the control number on the computer control box and that switch is turned on.

"You can imagine what impact this would have on the maintenance and reliability of an aircraft," says Cotter. "Instead of working with dozens of wires for a repair job, you have only, say, two wires compared to 20 to check. And as an additional feature, many new systems could easily be hooked up to the aircraft without any major wire rework."

One prototype multiplex system for the U. S. Navy has already been completed. The Navy required an electronic system for the A-6 to evaluate and test sonar buoys used in submarine warfare and transmit the data back to the carrier. The controls in the cockpit alone would have taken up 18 inches of space.

Employing the multiplex concept, the lab crew installed, integrated, and tested all the communication and control receivers, transmitters, and antennas in an A-6 drop tank. And the control box occupied only eight inches of space. The new system has the added feature of being able to take on new systems or to replace old systems with minimum wire rework.

At present, the Navy is using the multiplex system on an A-6 Intruder aboard the U.S.S. Kitty Hawk and has just placed orders for three additional prototype systems.

"Of course," says Cotter, "all the wires in an aircraft can not be consolidated to just a few multiplex system terminals—but there are many that can be. And don't forget the savings in cost and cockpit space, and the increased reliability and adaptability that can be attained."

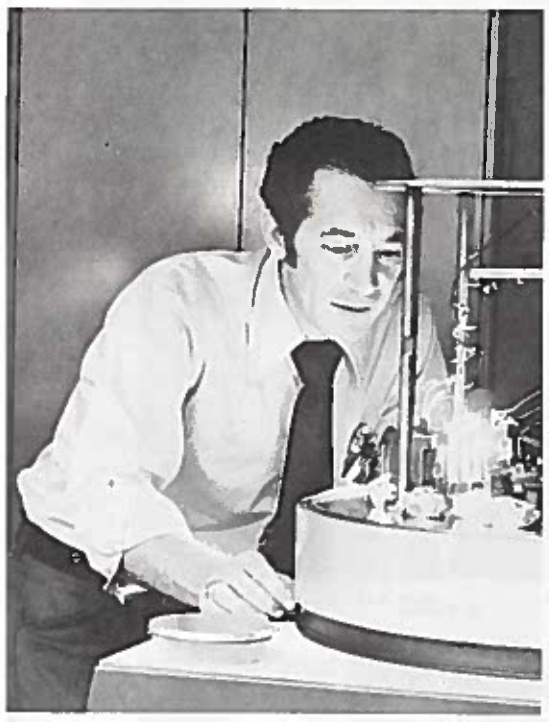
Unlike multiplex systems, "the potential of hybrid microsystems is still unmeasured," says John Arleth, head of the Plant 14 hybrid microsystems laboratory.

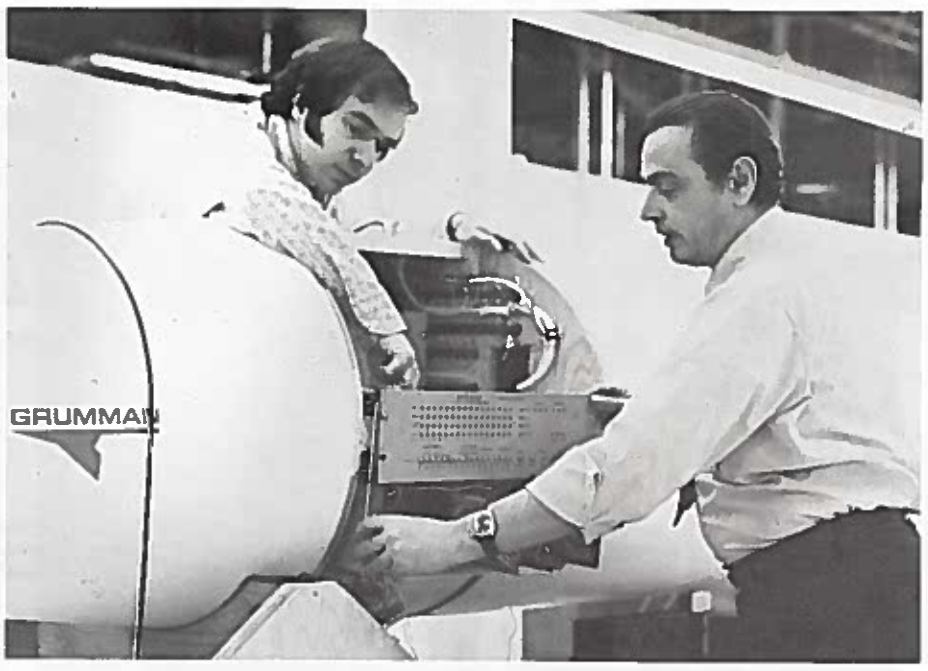
'Wealth of knowledge'

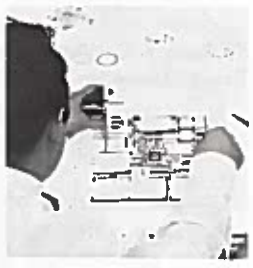
In past years, a large portion of this lab's work dealt with failure analysis of hybrid micro-circuits, but now with the acquisition of additional equipment, Arleth and his staff are busily producing their own prototype "mini" circuits. "Our experience in analyzing the failure of other companies' hybrid circuits used in Grumman aircraft," he says, "has given us a wealth of knowledge."

Where normally a four-by-five inch circuit has been used in electronic systems, the hybrid microsystems being developed in Plant 14 lab are one-inch square. Throughout most of the prototyping, mircoscopes and closed circuit television screens are used to review the minute systems.

lp shape Grumman's tomorrows







Photos by Jim Wagner and Fred Annette

The first production stage of a hybrid microcircuit is taken from an engineer's logical diagram. Bob Bisley makes a circuit layout with black tape on a 10-inch square diagram. "I approach it much like I would playing chess . . . trying to minimize any errors that might occur on the microcircuits. In a sense I am working out a strategy requiring the least amount of moves."

The 10-inch square is then photographically reduced to a one-inch square. This one-inch print and negative is used throughout the production process to determine the exact location of the substrates which connect the transistors on the micro-circuit. After the substrates have been incorporated on the square circuit, the "chips" (transistors) or "dice" the size of a pinhead are soldered in place using a wire one-thousandths of an inch in diameter (thinner than human hair.)

Adhering to the company-wide energy conservation drive, the hybrid microsystems crew have put up signs on the walls of the lab: "Save a microwatt." Besides using less power compared to today's circuits, these microsystems are more economical, weigh much less, are much smaller and more reliable, says Arleth.

These prototype circuits, aside from being incorporated into the multiplex systems, are also being used in the Sparrow missile test station for air-to-ground communications. And the staff is presently working with advanced development engineers on decreasing the size of the commercial Nozzle Pump Operator . . . with the objective of making it more compact and reliable.

Delving into the future can have its stumbling blocks though. "Trying to keep abreast of today's electronic advances in not an easy task," says Chris Witt, Plant 14 manager, "and trying to predict what the future will bring is even more difficult.

"At Plant 15 we are looking into the future and exploring fields that, for the most part, Grumman has not been in," says Witt. "But you must remember that frequently the development work that makes a difference between winning and losing a competition takes place years before the proposal deadline."

Plant 14 is certainly not a "sandbox"—a place to test interesting but non-productive scientific theories—Witt emphasized. "It's difficult to measure the amount of productivity coming out of a plant like ours, because we are not an assembly line operation."

The people in Plant 14 are experienced specialists in their respective fields. So, while they are busily researching the latest advancements and theories in the electronics field, they are also tackling the problems of today.

"Because we have the capability of prototyping electro-mechanical systems in the shortest amount of time," he says, "Plant 14 has acquired the name of 'Tigerworks'."

Equipped with the latest in electronic production and test equipment, the experienced Tigerworks crew quickly responds to the electronic needs of todays aircraft programs, and in addition, assist proposal teams make breadboards and prototype electronic devices.

Quick-response effort

By quick response, Witt doesn't mean that the Tigerworks team performs overnight tasks. But "compared to the average period of time it takes to set up an electronic system production line, the Tigerworks crew can produce prototype devices until the normal production commences quickly."

For instance, the Plant 14 prototype mechanical and electronics shops were able to produce 46 F-14 engine overhead alarm systems over a period of eight months while production facilities were being arranged in the Great River plants. The end result: the first 36 systems were ready for "update" installation on the Tomcats already built and the remaining 10 went to the F-14s under production. No production time was lost.

"It is a very productive and efficient method to initiate a new electronic system into an aircraft program," says John Rysanek, leadman in the prototype electronics shop. "We work very closely with engineering, and by the time the electronic part goes into the full production swing, all of the 'bugs' are ironed out."

Whether the Tigerworks crew is tackling today's tasks or examining what the future might bring, they have one common goal: to keep Grumman's winning edge in electronics.

(Trying to capture the full electronic horizons at Grumman is difficult in one *Plane News* article. Therefore, a future issue will contain a story about the other Tigerworks crew members in the laser, simulation, and thermodynamics efforts.)

J. W. Zito | A. Zoccoli | F. Romano | J. Hart | C. E. Boccaccino | J. A. White | F. Lupo | E. M. Raab | G. W. Fordham

service milestones

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William J. Gander, Aero Test (5)
Frank Lissenden, Ship & Spares Consolid. (17)

30

Chester C. Andrews, Prod. Plt. 1
Ralph C. Straub, Insp. - Mechanical (1)
Robert C. Harris, Jr., Prototype (2)
Gerard F. Hoffman, Controls (2)
Settimio Ruggiero, Jr., Steel Parts Assy. (2)
Edward L. Leonard, Prod. Ctl. (2)
Robert J. Munch, Mfg. Ops. Admin. (2)
John S. Lankewicz, Alodine (3)
Walter G. Gustoski, Spotweld (3)
Anthony Jesaitis, Methods Eng. (3)
Francis J. Sciacchitano, Meas. Stand. Mgmt. (12)
Walter J. Boyce, Plt. 14/26 Inst. Mgmt. (14)
Joseph A. Lazar, Sys. Reliab. & Safety (15)
Cleo L. Rhodes, Prod. Plt. - Mgmt. (27)
Jack W. Ehlen, Est. & Pricing Program (30)
Frederick E. Butzbach, Prod. Ctl. (36)
William J. McLean, Grumman Corp.

25

John W. Zito, Elect. Fab. (1)
Anthony Zoccoli, Planning - Mgmt. & Staff (1)
Frank Romano, Steel Parts Assy. (2)
Ernest E. Maxcy, Ordnance (2)
Jacob Hart, Dispatching WIP (2)
Chris E. Boccaccino, Prod. Ctl. - Parts Ctl. (2)
James A. White, Assy. Meth. & Planning (2)
Frank Lupo, Planning (2)
Edward M. Raab, Prod. Mfg. - Budgets (2)
Gerald W. Fordham, Repair Control (2)
Richard T. Moebes, Special Tools & Meth. (2)
Edward Barton, Trans. (2)
Walter Matuza, Methods Engg. (3)
Anthony J. Salamone, Jr., Maint. Indust. Ctl. (3)
Walter C. Berndt, Flt. Crews (4)
Joseph Schneider, Prod. Plt. - Mgmt. & Staff (5)
Carolyn G. Angus, Telephone Servs. (5)
Herman F. Schenck, Veh. Technology Mgmt. & Staff (5)
Martin J. Hagen, Instr. Test (6)
John S. Grewar, Jr., Prod. Plt. - Mgmt. & Staff (6)
George E. Foster, Quality Engg. (6)
Albert J. Ficken, Maint. Controller (7)
William L. Horney, Chemical Engg. (12)
Mason M. Matthews, Electronic Test (14)
Edward A. Zakshevsky, Est. & Pricing Program (25)
Joseph Adamo, Facilities Adm. (30)
George W. Schwarting, Q.C. Supplier Control (30)
Frederick D. Roemer, Est. & Pricing Program (30)
Edward J. Kelly, Loads & Dynamics Staff (35)
John L. Sullivan, Administrative Controls (35)
Richard C. Miller, Drafting (35)
Mark E. Mellinger, Admin. Ops. Mgmt. (35)
Stephen T. Kertesz, P/S Training (39)
Lenward Spellman, GSE Mechanical (43)
Henry Erschen, Electronic Test (43)
Frederick Liedtke, Prod. Avionics Mgmt. & Staff (43)
Samuel Bowden, Meth. Elect. Tech. Sys. (43)
Rudolph A. Avitabile, Avionics Mgt. (43)
Warren G. Coates, Dispatching (44)

(Continued on page 7)

R. T. Moebes | E. Barton | W. Matuza | A. J. Salamone, Jr.

W. C. Berndt | J. Schneider | C. G. Angus | H. F. Schenck

J. S. Grewar, Jr. | E. E. Foster | A. J. Ficken | W. L. Horney

M. M. Matthews | E. A. Zakshevsky | J. Adamo | G. W. Schwarting

F. D. Roemer | E. J. Kelly | R. C. Miller | M. E. Mellinger | S. T. Kertesz | L. Spellman | H. Erschen | F. Liedtke | J. J. Chisholm

S. Bowden | R. A. Avitabile | W. G. Coates | M. J. Infurna

F. W. Ligon, Jr. | D. F. Oehl | M. A. Paden, Jr. | J. J. Prendergast

October anniversaries . . .

(Continued from page 6)

Michael J. Infurna, P/S A/C Sys. Serv. (80)
Fred W. Ligon, Jr., Configuration/Data Mgmt. (80)
Donald F. Oehl, Q.C. Supplier Control (87)
Martin A. Paden, Jr., Q.C. Supp. Ctl. (87)
James J. Chisholm, Production (88)
John J. Prendergast, P/S A/C Site Mgmt. (89)

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Warren E. Shields, PPO - F-14 (1)
Eleanor Scott, Form Block (2)
Charles Garite, Maint. - Facl. Equip. (2)
Alfred M. Whitehurst, Trans. - Operations (3)
Thomas J. Keenan, Equipment Lines (4)
Wilbur W. Eliezer, Supp. Squip. Prod. (5)
Eldred J. Bornemann, Aero Test (5)
John F. Foray, Maint. Rearrangement (6)
Ann M. Pierro, Food Service (6)
Edmund K. Detlefsen, Trans. (7)
Clifford R. Heitman, Trans. (7)
Abraham S. Katz, Maint. Controller (7)
James M. Purtee, Plastic/Plaster Tool. (11)
John A. Hunt, Electronic Test (14)
Charles Holowchak, Electronic Test (14)
Richard H. Christoffer, Trans. (20)
Harry Braun, B/P Warehouses (21)
Joseph J. Bundy, Structural Design (25)
Eugene P. Donovan, Fiberglass (27)
Julius F. Averna, Procurement Services (30)
Paul J. Damico, P/S Pubs. Control (34)
Edward J. Kennelly, Research Operations (35)
Richard T. Inman, Planning (43)
Anthony Mancuso, Maint. Rearrangement (44)
Vincent Frins, Maint. Admin. (77)
Basil J. Poulos, Flight Test (88)

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Nicholas J. Hawrey, Ctr. Sect. Final (3)
Robert Gawlik, Honeycomb Prefit (3)
Albert C. Durner, Structural Analysis (4)
James T. Hebron, Calverton Operations (6)
Gerald P. Scannapieco, Electronic Test (14)
Robert W. Brandstetter, Electro-Optical Design (14)
Charles D. De Sio, PT/Proj. Eng.-Elect Eng. (30)
George A. Emilio, P/S Program Mgmt. (35)
Jacques M. Crouzet Pascal, Materials & Struct. Mech. (35)
Albert L. Loeffler, Jr., Fluid Mechanics (35)
Charles R. Maimone, Jr. Hydraulics (36)
William R. Richards, Jr. Wire Prep. (44)
Kenneth F. Dow, Grumman Ecosystems

Sorry 'bout that . . .

In August, William Small of P/S Provision Requirements, Pl. 30, marked 25 years service. Joe DeCarlo of Research Ops., Plant 43, and Ed Malinowski of Q.C. Supplier Controls, Plant 87, reached their 25 year milestone in September. And Herbert Wilhelm of E.B.W.-Final Assembly, Pl. 2, marked 30 years' service at Grumman in August. Congratulations!

W. A. Small Jr. | J. DeCarlo | E. V. Malinowski

Special delivery, far from home

Everybody knows that a guy reaching 25 years' service with Grumman gets a nifty Accutron watch to mark the event . . . but does everyone know that his wife gets 25 long-stemmed roses—an anniversary memento established some years ago — to thank her for contributions during that time. (Sorry fellas, there's no reciprocal agreement for the spouse of a woman marking 25 years.) When the wife happens to be about 10,000 miles from home base in Bethpage, delivering those roses is a little more difficult . . . but not impossible.

When Harvey Abrams, a Field Service rep aboard the carrier Midway, which is home-ported in Yokosuka, Japan, recently celebrated a quarter-century with Grumman, a deliveryman showed up right on schedule with her roses, too. But it wasn't the local florist . . . the honor fell to Len Galupo, another Field Service rep serving with Abrams aboard the carrier. Judging by the smiles of Lucinda Abrams and Galupo, the "Say It With Flowers" tradition is quite a hit. And Harvey, though not shown here, wasn't forgotten. Besides baking cake—and eating it with him at a special party—Cdr. J. J. Hower and the men of VA-115, an Intruder squadron aboard the Midway, celebrated the anniversary by presenting Abrams with a lighter to mark the occasion.

Around and about . . .

Walt Krudop, a Grumman veteran of 34 years' service, has been named to the board of visitors at Suffolk Developmental Center (formerly Suffolk State School) at Melville. Walt has long been active in community affairs, is currently on the board of directors for the Suffolk County Association for Retarded Children, and treasurer of the Suffolk County Mental Health Clinic. . . . Al Tobias of Product Support, Plant 15, is looking for donations of evening gowns—any size—for a wheelchair residents' ball, also at the Suffolk Developmental Center. If you can help, call Al at home, 271-4486. . . . And in the academic field, Athanasios Vasilopoulos of Mission and Systems Analysis, Plant 15, was awarded a PhD in Operations Research (Applied Statistics) from New York University. . . . Ivan Kadar was saluted by the Institute of Electrical and Electronics Engineers a couple of weeks ago with its "M. Barry Carton Award" for his paper: "An Analysis of Helicopter Rotor Modulation Interference." Kadar is a member of the technical staff to the manager of Electrical and Electronic Design Engineering, Plant 5.

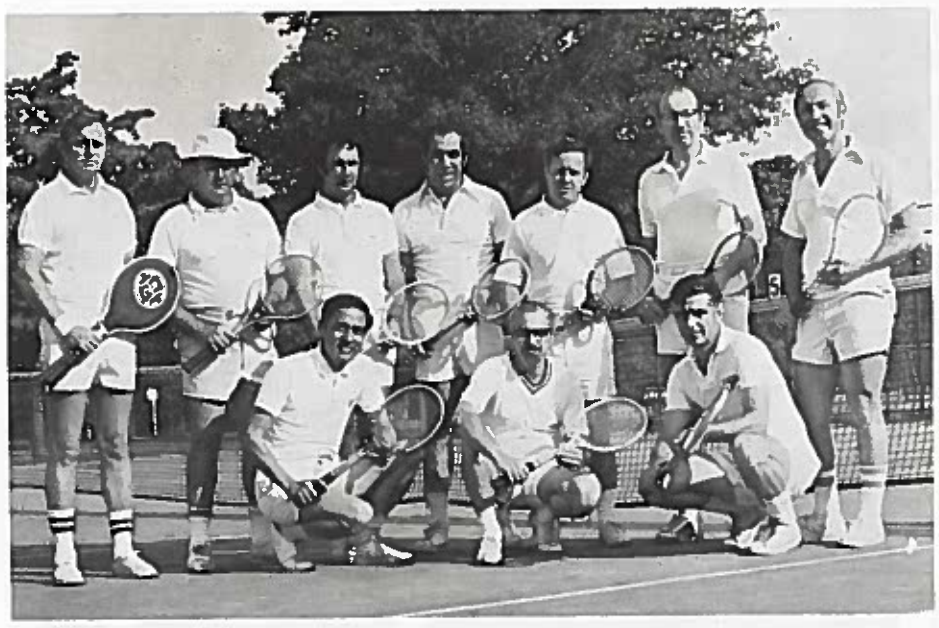
An invitation . . .

Interested in learning more about aviation management?

The Aviation Management Institute at C. W. Post College may be just what you're looking for. The Institute offers speakers on a range of technical and business topics plus a variety of seminars and tours.

The Institute will be holding its next meeting on November 13, 1974 at 6 p.m. at C. W. Post College, Roth Hall, Seminar Room 309. Visitors are welcome.

For additional information, contact E. Capobianco (phone: 516 621-8811) or Dr. C. Cavalconte (phone: 516 299-2369), or write Aviation Management Institute, C. W. Post Center, P.O. Box 413, Greenvale, N. Y. 11548.



Golden touch. For the third consecutive year, the Grumman Gold varsity tennis team captured second place in the L.I. Industrial tennis league . . . right behind the first place Grumman Blue squad. Gold racketeers are (L to R) standing: Wayne Mercer, Dave McKendrick, Pete Shyprykevich, Joe DiStefano, Bob Bentler, Craig Langwost, and Norm Dvoskin. Kneeling: John Hsu, Dick Bergman (captain), and Andy Kaufman. Not pictured are Gerry Fogel and Marty Klop. ((Photo by Bob Settles)

Player wins 'shoe tourney

After capturing the singles and then the doubles horseshoe crowns in the annual GAA Bethpage tourney, no one can doubt Russ Player's prowess in the horseshoe pits.

In his quest for the singles championship, Player outpitched Newsome, 21-0, 21-0; Hugh Donovan, 21-17, 21-6; and John Giusto, 21-13, 22-0. In the finals, the champ ran into tough competion against John Damico but took the title, 14-23, 21-17, 24-14, 11-21 and 21-4.

Winning combo

Teaming up with Bob Fritz, it was smooth sailing in the regular play as Fritz-Player defeated Bill Barber-John Giusto, 21-10, 23-3; and Raymond Wrobleski-John Harms, 21-11, 14-21, 21-19. In the finals against Hugh Donovan and Fred Allen, they ran into a little trouble in the opening two rounds of the best-of-five series, dropping them 16-21, and 20-21. Then Player and Fritz made a comeback — a victorious one — winning the next three games 21-19, 22-9, and 22-19.

Hams growing

The Grumman Amateur Radio Club has just put into operation its two-meter FM repeater station, WR2ACW. The repeater, licensed to automatically retransmit the radio signals of other amateur radio stations for the purpose of extending their intra-community radio communication range, is located in the WA2LQO radio shack on the roof of Plant 5.

All two-meter FM Grumman hams are invited to use this open, carrier-accessed repeater operating on 146.145/146.745 MHz from 7 a.m. to midnight daily. For more information, call Radio Club President Dave Goldblum on x86231.

The Grumman Amateur Radio Club meets on the third Wednesday of each month at 5 p.m. at the WA2LQO radio shack on the roof of Plant 5.

Keglers christen season with high scoring

After a long summer layoff, Grumman bowlers are back on the alleys beginning the 1974-75 season. Already team captains are wondering why their bowlers didn't practice during the summer . . . and bowlers who didn't practice are wondering why themselves.

Four new leagues have joined the ranks bringing the grand total of GAA-sanctioned leagues to 31. New bowlers report that there are many enthusiastic and experienced bowler-instructors teaching them to become '200' average keglers right away—but first they'd like to know how to keep the ball out of the gutter.

Joe Wickel christened the newly formed Grumman Goose league alleys with 211 the first night. Fellow keglers who joined him in cracking the '200' mark were: R. Karpinski, 206-200-576; and Walt Becher, 203-567.

Bill Buchman of the newly formed Great River Nite Owl league set a high-game and series record that will be on the charts for some time. He rolled 277-219-643. Other action for the new league: Rudy Dunkley, 212-506; Vince Lombardo, 213; Tony Galardi, 210; Randy Miller, 204-224; and Michael Ney, 208.

Moorehead rolls 246

Center of attraction of the Aerospace lanes recently was Bob Moorehead, who broke the three week standing record of 212 with 246-551 showing. Fellow keglers also enjoying a good night were: B. Harris, 232-571; J. Cilento, 222-569; T. O'Connor 205-576; and B. Rooney, 201-551.

Highlights in the Classified league: Sam Bowden, 231-579; Henry Burkhardt, 200-562; and D. Farrell, 222. And on the Master league alleys (four-games scores); Ray Zeller, 242-827; Tom O'Connor, 233-800; Don Eivers, 223-826; Ike Washington, 806; and Fred Skirde, 222-786. Action in the Syosset Mixed alleys: Eric Bunzel, 201-224-563 and George Bunzel, 224-524.

Until the season gets well into the second half, league records usually fall week-after-week. Such is the case in the Red league. Ben Monte erased the previous high game tally with his 221. Then the following week Joe Glasser topped him with 237-556. Among other high scoring keglers were: Russ Cox 209-555; Bob Nielsen, 205-557; Charles Marchessault, 221-546; and Herb Pirkl, 201-213-570.

Juppe leads way

On the Woodbury Mixed alleys Martha Juppe led the way with 212-555. Ruth Christianson swiped high game honors from Martha but not the series crown with 224-551. Other highlights were: Carol Mayer, 191-523; Jim Cash, 226; Tom Szwejkowski, 212.

Action on the outpost alleys: Dan Plisken, 218-591; John Zamojcin, 235-578; Joe Avanzato, 219-560; Frank Magri, 213-561; Walt Kulbaba, 595.

Wanted: cyclists

Anyone interested in forming a Grumman Bicycle Club with group ride and touring in mind, please contact fellow cyclists, Dave Hartman or Bill Bosakowski, on Ext. 86335 or 1586.

Table tennis, anyone?

The Table Tennis Club meets every Thursday evening from 5:30 to 8:30. If you're interested in paddling away for an hour or two, or are a beginner and wish to learn this international sport, why not stop by Plant 24 on a Thursday night. For more information, call Frank Malone, Ext. 7951.

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BETHPAGE, NEW YORK 11714

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Calverton champs: Pl. 7

After the dust settled, the Plant 7 All Star softball team raised the victory flag while the rival Plant 6 squad lowered their heads in defeat. Well, perhaps it wasn't quite that traumatic after Plant 7 had defeated Plant 6, 18-12, thus earning the bragging rights at Calverton. The vanquished Plant 6 All Stars may have lost the battle but not the war. It was just the first annual Calverton All Star classic and they plan on re-organizing their troops for next year's confrontation on the home front.

The Plant 7 combatants began the assault in the opening inning with six runs. The closest their opponents got was in the bottom of the seventh, 13-12. But the number one team at Calverton sewed up the game in the last two innings with five more players crossing the plate.

During the course of the battle, small artillery was fired—34 singles and only two doubles. Plant 7 players Ray Rodriguez and George Severin hit the two baggers. Top slugger for the victors was shortstop Bill Hunt going four-for-five at the plate.